

## Nasal harmony in Deori

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Deori is a Tibeto-Burman language spoken in the Northeastern States of Assam and Lohit and Changlang districts of Arunachal Pradesh. It belongs to the Bodo-Garo group which is listed as a ‘definitely endangered’ language in UNESCO (2009). Deori is considered an endangered language because of its less number of speakers (Brown, 1895) and lack of intergenerational language transmission (UNESCO, 2009). Deori has 14 distinct consonants and they are: [±voice] stops /p/ /b/ /t/ /d/ /k/ /g/, [+voice] nasals /m/ /n/, [±voice] fricative /s/ /h/, [±voice] affricates /tʃ/ /dz/, [+lateral] /l/, [+continuant] j/, and three allophones: [+nasal] [ŋ], [-lateral] [ɭ] and [+continuant] [w]. Deori has ten distinct vowels: 5 oral vowels /ɑ, ε, i, ɔ, u/ and 5 nasal vowels /ã, ê, ĩ, õ, û/. This is the first time that Deori nasal harmony has been discussed.

Deori has (1) distinct nasal vowels which changes the lexical meaning of a word, for instance, the words *bi* ‘peel’ and *bĩ* ‘carry’ have different meanings because of the nasal-oral vowel contrasts, (2) vowels in proximity to nasal consonants are also nasalized in Deori, for instance, *mēba* ‘fat’, *m̃sa* ‘child’, and (3) nasalization in Deori is also attained through the process of ‘nasal effacement’<sup>1</sup> where the presence of nasal vowels may be the outcome of a context where a sequence of oral vowels existed in close adjacency with nasal consonants before the deletion of the consonant, for instance, *aŋ* > *ã* ‘first person singular’, *tʃitun* > *tʃitũ* ‘rope/old’. The nasal harmony system adheres to an implicational hierarchy shown in (4) where the segments to the left will undergo nasalization, while those to the right will block.

(4) <sub>1</sub> Vowels <sub>2</sub> Semi vowels <sub>3</sub> Liquids <sub>4</sub> Fricatives <sub>5</sub> Obstruent Stops <sub>6</sub>

← high-compatibility with nasalization-low →

The hierarchy in (4) highlights that vowels, semi-vowels, and liquids are highly compatible with nasalization, fricatives, and obstruent stops are less compatible with nasalization.

Vowels are the triggering segment in Deori which affects glides, and liquids. Glides and liquids are the target segments in Deori, for instance, *gã.ĩõ* ‘pot’, *tʃĩĩã* ‘fish/wife of younger brother’. Apart from vowels, nasal consonants also trigger nasal harmony in Deori, for instance, *mĩũũ* ‘uncooked rice’, *nĩĩã* ‘cook’, *m̃k̃õ* ‘rice’, *m̃sã* ‘grass, weed’, *m̃ĩĩõ* ‘platform of the house’. The examples also highlight that nasalization does not spread through [+voice] obstruent stop /b/ (example: *ibã* ‘flower’), [-voice] fricative /s/ (example: *isã* ‘shawl’), and [-voice] affricate /tʃ/ (example: *aʃõ* ‘house’) in Deori which are less compatible with nasalization.

Directionality in Deori is progressive and can be verified when root+suffix words are taken into consideration. Glottal fricative /h/, and glides [w] and [j] are target segments in Deori. The locative suffix *-hɔ*, the thematic marker *-wa*, and the possessive marker *-jɔ* have a nasal variant *-h̃õ*, *-w̃ã*, and *-j̃õ* respectively, for instance, *udzũ.hɔ*<sup>2</sup> → *udzũh̃õ* ‘navel/bamboo tube.LOC’, *ditõ.hɔ* → *ditõh̃õ* ‘throat.LOC’, *dã.wa*<sup>3</sup> → *dãw̃ã* ‘mosquito.THEMATIC’, *nõ.wa* → *nõw̃ã* ‘2<sup>nd</sup> person sing/pl. THEMATIC’, *tʃĩĩã.wa* → *tʃĩĩãw̃ã* ‘the fish.THEMATIC’. Following Walker and Pullum (1999), nasalized glottal fricative /h/ can be termed as laryngeals for their glide like phonological classification and are grouped with highly compatible segments, vowels, and glides. Obstruent stops /p, t, k, d, g/ are opaque to nasal harmony in Deori as it blocks nasal spreading, for instance, *nĩĩã.pa.ɪ* → *nijãpa.ɪ* ‘cook.CAU.PROG’ → ‘made to cook’, *nõ.pa.ɪ* → *nõpa.ɪ* ‘do.CAU.PROG’ → ‘made to do’, *hidzẽ.ku.n* → *hidzẽkun* ‘see.FUT<sup>4</sup>.IMP’ → ‘will see’, *tũ.nẽ.du* → *tũnẽdu* ‘throw.IMP.APPL’ → ‘throw at somebody’, *hidzẽ.gɛ* → *hidzẽgɛ* ‘see.NEG’ → ‘could not see’, *nĩĩã.gɛ* → *nijãgɛ* ‘cook.NEG’ → ‘could not cook’.

<sup>1</sup> Nasalization of vowels necessitates two stages. First, a syllable-final nasal triggers regressive vowel nasalization, and secondly, the syllable-final nasal gets deleted but the feature [nasal] remains. This context of nasalization of vowels is referred to as ‘nasal effacement’ by Foley (1975).

<sup>2</sup> Locative suffix.

<sup>3</sup> Demonstrative marker.

<sup>4</sup> Future marker


The target and the opaque segment in Deori agree with the implicational hierarchy in (4). However, there are a few exceptional occurrences in Deori that show deviation from the cross-linguistic nasal harmony typology. The exceptional occurrences in Deori are: (i) [+continuant] liquid [ɭ] changes to sonorant stop /n/ when preceded by a nasal vowel in the derived domain, unlike underived domain, and (ii) [+voice] obstruent stop /b/ undergoes nasal harmony in the derived domain and changes to /m/ when preceded by a nasal vowel. While [+voice] alveolar and velar stops /d/ and /g/ block nasal harmony in Deori, [+voice] bilabial stop /b/ undergoes nasalization in derived domain and changes to /m/. For instance, after oral vowels, *ʃa.ba* → *ʃaba* ‘bad.VN’, *kɔ.ba* → *kɔba* ‘come.VN’, after nasal vowels, *bɔ̃.ba* → *bɔ̃mã* ‘somewhere.VN’, *kã.ba* → *kã̃mã* ‘hot.VN’. In these examples, it is evident that the verbal-noun suffix *-ba* and *-bem* are realized as *ba* and *bem* after oral roots and changes to *mã* and *mẽm* after nasal roots. Liquid [ɭ] is a target segment both in the derived and the underived domain, but in derived domain liquid [ɭ] changes to /n/, unlike underived domain. For instance, after oral vowel, *ʃuʃa.ɛ* → *ʃuʃaɛ* ‘good health.FOC’, *saba.ɛ* → *sabaɛ* ‘illness.FOC’, after nasal vowel, *ʃiʃã.ɛ* → *ʃiʃã̃nẽ* ‘fish.FOC’, *nĩĩã.ɛ* → *nĩĩã̃nẽ* ‘cook.FOC’. Suffixes *-ɛ*, *-i*, and *-ɔm* remain oral following an oral root and suffixes *-ɛ*, *-i*, and *-ɔm* change to *-nẽ*, *-nĩ*, and *-nĩm* respectively when preceded by a nasal vowel. This unusual pattern of suffixal alternation in Deori does not conform to the implicational hierarchy shown in (4).

Walker (1998) has formulated a unified typology of featural markedness constraints which captures nasal harmony pattern cross-linguistically and has ruled out faithfulness constraints, as shown in (5).


(5) \*NASOBSSTOP » \*NASFRIC » \*NASLIQ » \*NASGLIDE » \*NASV

While the target segment in Deori is taken care of by ranking spreading constraint SPREAD-R([+nasal], Pwd) over the markedness constraints \*NASLIQ » \*NASGLIDE » \*NASV, the opaque segment in Deori is taken care of by the ranking \*NASOBSSTOP » \*NASFRIC » \*NASAFFRICATE » SPREAD-R([+nasal], Pwd) as shown in tableau (6) and (7) below:

(6) Vowels are target segments in Deori

I: /tʃimĩ/	SPREAD-R([+nasal], Pwd)	*NASV
a. tʃimi	*!	
b.  tʃimĩ		*

(7) Opacity of voiceless obstruent stop

I: /nɔ̃/+/pa/+/i /	*NASOBSSTOP	SPREAD-R([+nasal], Pwd)	SPREAD ([+nasal], W)
a.  nɔ̃pa.i		****	****
b. nɔ̃pãĩ	*!		

However, the markedness constraints that predicts the nasal harmony pattern cross-linguistically fail to capture the exceptional suffixal alternations in Deori in the derived domain. Modification of constraints in OT in capturing borrowings from a different language is attested in the works of Tsuchida (1995) and Davidson and Noyer (1997). Tsuchida (1995) states that OT constraints must be modified to account for the phonology of English loan words in Japanese. Similarly, Davidson and Noyer (1997) state that borrowings from Spanish into Huave violate Huave stress rules, thus, to account for the lexical borrowings re-ranking of the constraints is necessary. Nasalization in Deori is considered as an areal feature and is adopted from languages such as Mishmi and Tani dialects of Arunachal Pradesh with whom Deori was in close contact with (Jacquesson, 2005). Hence, it can be assumed that exceptional occurrences of suffixal alternations in Deori are contact-induced innovation which necessitates an additional constraint to account for such occurrences.

#### References:

- Brown, W. B. (1895). *An Outline Grammar of the Deori Chutiya Language*. Assam secretariat office.  
Davidson, L., & Noyer, R. (1997). Loan phonology in Huave: nativization and the ranking of faithfulness constraints. In *Proceedings of WCCFL15* (pp. 65-80). CSLI Publications.

- Foley, J. (1975). Nasalization as a universal phonological process In C.A. Ferguson, L.M. Hyman, and J.J. Ohala (eds.), *Nasálfest. Papers from a Symposium on Nasals and Nasalization* (pp. 197-212).
- Jacquesson, F. (2005). *Le Deuri: Langue Tibéto-Birmane D'Assam*. 88. Leuven: Peeters Publishers.
- Tsuchida, A. (1995). English loans in Japanese: Constraints in loanword phonology. *Working Papers of the Cornell Phonetics Laboratory*, 10, 145-164.
- UNESCO 2009: *Atlas of the World's Languages in Danger* (interactive online edition). (<http://www.unesco.org/culture/ich/> and <http://www.unesco.org/culture/ich/UNESCO-Endangered Languages Statistics-20090217.xls>). (Retrieved on 12 July 2018).
- Walker, R., & Pullum, G. K. (1999). Possible and impossible segments. *Language* (pp. 764-780).